NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(Pursuant to NAC 445A.874)

Permittee Name: **Enel Salt Wells, LLC**
Permit Number: **UNEV2005214**
Project Name: **Salt Wells Geothermal Project**
Address/Location: **17 miles SE of Fallon, Churchill Co.**
Permit Action: **UIC Draft Permit Issuance**
Type of Project: **Geothermal Power Production**
Injection Wells (#): **Eight (8)**

A. Description of Discharge

Location: Up to eight (8) injection wells to be located at the Salt Wells KGRA facility in the following sections: Sections 23, 24, 25, 26, 35, and 36 T.17N., R.30E., M.D.B&M.

Injection Well Locations:

Well Name/No.	Well Location (M.D.B.&M., Churchill County, Nevada)	Longitude	Latitude
IW-1 (64-36)	SE ¼ SE ¼ of Section 36, T17N, R30E	118° 33' 37" W	39° 17' 34" N
IW-2 (73-36)	SE ¼ NE ¼ of Section 36, T.17N., R.30E	118° 33' 28" W	39° 17' 36" N
IW-3 (65-36R)	NW ¼ SE ¼ of Section 36, T 17N, R30E	118° 33' 36" W	39° 17' 28" N
IW-4 (63-36)	SW ¼ NE ¼ of Section 36, T.17N., R.30E.	118° 33' 41" W	39° 17' 40" N
IW-5 (54-36)	SW ¼ NE ¼ of Section 36, T.17N., R.30E	118° 33' 47" W	39° 17' 34" N
IW-6 (52-36)	Permitted – Not Drilled		
IW-7 (56-23)	Permitted – Not Drilled		
IW-8 (45-23)	Permitted – Not Drilled		

As of June, 2008, five (5) injection wells and five (5) production wells have been drilled in the project area, but are not piped. The plant is under construction. Flow rate to the injection wells is scheduled to be between 10,000- 11,000 gallons per minute (gpm). Proposed target injection zones lie between 850' to 1500' below ground surface. In addition to injection, the applicant uses an evaporation/infiltration pond to dispose of geothermal fluids produced during test and maintenance procedures. Basins are utilized at existing injection wells for emergency or maintenance procedures.

Characteristics: The injectate consists of geothermal fluid which has been passed through a binary power generating plant. The system is air-cooled and no cooling tower blowdown fluid is produced. Chemical additives are not routinely used, although tracer dye tests and special treatments are occasionally approved by the Division pursuant to the permit. The injectate has a slightly alkaline pH and an average TDS content of approximately 2620 mg/l with sodium and chloride being major constituents. Geothermal fluids typically have elevated levels of boron, lithium, fluoride, arsenic and slightly elevated levels of silica.

Geothermal injectate fluid occasionally exceeds the secondary maximum contaminant level guidelines for iron; however, ongoing monitoring data will indicate if the groundwater is being degraded, and in general, receiving waters and the shallower waters are high in iron. Sampling procedures or lab procedures could account for iron variability. The non-condensable gas content of the reservoir fluid, typically, is low. A small amount of carbon dioxide was recorded in the mud logs of PW-4 and PW-5, but CH_4 and H_2Swere not detected.

Below is a comparison of the injectate to the characteristics of the receiving reservoir fluids:

Table 1

Table 1 – Injectate / Receiving Water Comparison

Constituent (units)	Injectate Water- - Production Well PW-4 86-26 (1/08) T.D. = 550 ft.	Injectate Water- - Production Well PW-5 64-35 (3/08) T.D. = 700 ft.	Receiving Water- - Injection Well IW-3 65-36R (4/08) T.D. = 1650 ft.	Receiving Water- - Injection Well IW-5 54-36 (12/07) T.D. = 1801 ft.
pH	9.16	9.43	8.73	8.88
TDS (mg/L)	2800	2100	1900	2600
As (mg/L)	0.029	0.041	0.017	0.018
Sb (mg/L)	0.0100	0.014	<0.0025	0.0052
Ba (mg/L0	0.14	0.16	0.79	0.19
Be (mg/L)	<0.0010	<0.0010	0.0063	<0.0010
HCO_3	150	83	330	320
B (mg/L)	5.8	6.2	4.6	6.0
Cd (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
Ca (mg/L)	38	39	130	32
Cr (mg/L)	<0.0050	0.011	0.065	0.035
Cu (mg/L)	<0.050	<0.050	0.11	<0.050
F (mg/L)	6.6	0.45	8.7	5.7
Fe (mg/L)	2.6	1.1	48	3.2
Pb (mg/L)	<0.0025	<0.0025	0.039	<0.0025
Mn (mg/L)	0.18	0.084	1.4	0.23
Mg (mg/L)	1.3	0.69	13	3.8
Hg (mg/L)	<0.00010	0.0038	0.0050	<0.00010
Ni (mg/L)	<0.010	<0.010	0.091	<0.010
NO_3 (mg/L)	<1.0	<1.0	1.2**	<1.0
K (mg/L)	82	79	69	53
Na (mg/L)	990	870	910	1000
SO_4 (mg/L)	310	320	220	280
Tl (mg/L)	0.0012	0.0018	<0.0010	<0.0010
Zn (mg/L)	<0.010	<0.010	0.13	<0.010

** Reported value is estimate; the sample matrix interfered with analysis

B. Synopsis

General: Enel North America is proposing to construct a binary geothermal power generation facility within the Salt Wells Known Geothermal Resource Area near Fallon, Nevada (Location Maps). The plant is under construction as of 2008. The project's net electrical output is expected to be approximately 13 MW, but full operation design capacity is 24 MW (gross nameplate). The geothermal fluid is delivered to the power plant from the geothermal production wellfield at approximately 265 deg. F to 285 deg. F. The fluid is distributed to heat exchangers that will vaporize liquid isobutane. The resulting isobutane vapor powers turbine generators. The cooling system uses air cooling to condense the vaporized isobutane back to liquid form.

June 2007, NDOM Geothermal Project Area Permit #698 lists: 8 production wells with estimated depth of 1000'; 8 injection wells with estimated depth of 3,000'; and 10 observation wells with estimated depth of 1,000'. Submersible pumps are planned for the production wells.

The injection zone comprises volcanic rocks including basalt and lithic tuff between 450 and 1800 feet below the surface. Alluvial deposits (sand to conglomerate) lie about the volcanic units above the 150' to 350' level. The injection field is east area of project site, plant in central portion and production wells around west side.

The following table outlines injection well completion dates, depths, and injection intervals.

Well	DOM#	Completed	Loc	WH Elev	Depth	Injection Interval	Max Press
IW-1 (64-36)	571	5/05	Sec 36	3990'	12 ¼" hole - 1170'	500' – 1170' (f/shoe) 9 5/8" liner f/454	165 psig
IW-2 (73-36)	572	7/05	Sec 36	3968'	12 1/4" hole – 2224	**N/A**	N/A
IW-3 (65-36R)	735	4/08	Sec 36	4000'	12 ¼ " hole – 1650'	468' – 1650' (f/shoe) 9 5/8" liner f/327	155 psig
IW-4 (63-36)	734	1/08	Sec 36	3983	12 ¼ " hole – 1640'	495' – 1640' (f/shoe) 9 5/8" liner f/417'	165 psig
IW-5 (54-36)	733	12/07	Sec 36	4003'	12 ¼" hole – 1801'	476' - 1801' (f/shoe) 9 5/8" liner f/395'	158 psig
IW-6 (52-36)	732	Not Drilled					
IW-7 (56-23)	726	Not Drilled					
IW-8 (45-23)	725	Not Drilled					

Total depth of the production wells range from 485 to 700 feet. Production appears to be from discrete fractures, and the production zones range from 420 to 504 feet, based on known data. Injection is into or below currently utilized production zones. The shallow aquifer system is non-potable and only utilized seasonally for stock watering.

Geologic Setting/Hydrogeology/Geothermal Characteristics: The Salt Wells geothermal system occupies the area of gently sloping piedmont, with a thin veneer of alluvium over bedrock, between the bedrock hills of the Bunejug Range, and the deep sediments of the Salt Wells basin. Throughout the wellfield the rocks consist of Quaternary lacustrine and aeolian sediment, unconsolidated except in the instance of localized silica cement, interbedded locally with fine grained silts and lacustrine clays, averaging 50-200 feet thick. These sediments were deposited on top of the Bunejug volcanics, which primarily consist of basaltic andesite flows and tuffs approximately 2000 feet thick. Strong lithologic correlations between the wells are difficult because flows are discontinuous, of similar lithology, have preexisting topography from earlier surface weathering, and are offset by multiple small faults.

The geothermal resource appears to be localized along the western edge of the basin, which is dominated by an east dipping normal fault, at the boundary of the piedmont and the basin sediments. Several splays of this fault cut the piedmont and localize geothermal fluids. The resource is found within an area of high heat flow covering approximately 2 square miles trending north between the range front of the Bunejug mountains and the edge of the Salt Wells playa. Within this area, the resource is found at depths of 250 to 700 feet, in what is apparently a shallow outflow zone from a deep upwelling. Static water levels in this area are between 100 and 282 feet below ground surface. Peak temperatures in production wells drilled into this outflow zone range from 272 to 292 degrees F. Geothermal fluids migrate upward along a currently unidentified fault within the zone of the heat flow anomaly. The fluids spread laterally through permeable basalt layers and concentrate within fractures caused by the basin bounding fault and its splays. Within the area, elevations and temperatures of the geothermal waters indicate that flow across the piedmont is generally from west to east and south to north. Pressure logs do not indicate any confined aquifer conditions.

The injection zone is to the east of the heat flow anomaly and production zone. Injection will be into the permeable Bunejug volcanic at depths below the shallow geothermal outflow zone, between approximately 500 and 1600 feet below surface.

The only other use of groundwater in the area is an artesian groundwater well of unknown depth in nearby basin sediments east of the current leasehold, which is used seasonally for stock watering. The temperature of this well is not elevated and no connection to geothermal waters is known. Monitoring of water from this well has been proposed under the conditions of the Special Use Permit.

C. Receiving Water Characteristics

Geothermal fluids are injected back into the geothermal reservoir. On the average, injection is at or below production intervals. The TDS concentration of the geothermal reservoir increases moderately with depth. The injection process therefore should not degrade waters, unless unanticipated or unpermitted constituents are added to the injectate. TDS values in the geothermal reservoir fluids range from about 1900 to 4300 mg/l, with the major constituents being sodium and chloride. TDS concentrations above the geothermal reservoir are unknown at this time. Discharge of geothermal fluids to containment basins, or occasional minor unscheduled surface discharge due to leaks or unlikely accidents should

therefore not degrade groundwater quality.

	TDS		
IW-1	3,000	PW-1	2700
IW-2	4,300	PW-2	2800
IW-3	1,900	PW-3	2700
IW-4	3,400	PW-4	2800
IW-5	2,600	PW-5	2100

Water samples were collected at the end of the flow test, just before the air compressors were turned off. The samples were collected in a clean bucket at the end of the flow line at the edge of the reserve pit. Time and temperature were recorded. Five separate sample bottles provided by WET Lab were filled, following the specific directions from WET Lab. The samples were not filtered. After the sample bottles were filled, they were immediately iced down and delivered to WET Lab within 24 hours.

D. Procedures for Public Comment

The Notice of the Division's intent to reissue a permit authorizing the facility to inject into the ground water of the State of Nevada subject to the conditions contained within the permit, will be sent to the *Reno Gazette Journal* and *Lahonton Valley News* for publication no later than August 1, 2008. The notice will be mailed to interested persons on our mailing list (see Attachment A). Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice.

All written comments received during the comment period will be retained and considered in the final determination. A public hearing on the proposed determination can be requested by the applicant, any affected state, any affected interstate agency, the regional administrator of EPA or any interested agency, person or group of persons.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings will be conducted in accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

E. Proposed Determination

The Division has made the tentative determination to issue the permit contingent upon comments received during the public comment period and the public hearing. If no significant negative impacts due to injection are identified during this process, it is the intent of the Division to issue the permit.

F. Proposed Effluent Limitations and Special Conditions

See Part I.A.of the permit.

G. Rationale for Permit Requirements

Verification that the quality of fluid discharged to the injection well(s) remains constant.

Confirmation that fluids disposal does not adversely affect the existing hydrologic regime or biologic resources.

Prepared by: Russ Land
Date: June, 2008